

REMARKS

Applicants thank the Examiner for total consideration given the present application. Claims 1-16 were pending prior to the Office Action. Claims 1-16 have been canceled and claims 17-36 have been added through this Reply. Therefore, claims 17-36 are currently pending. Claims 17, 28-30, 35, and 36 are independent. Applicants respectfully request reconsideration in light of the amendment and remarks presented herein, and earnestly seek timely allowance of all pending claims.

CLAIM REJECTION - 35 U.S.C. § 101

Claim 11 is rejected under 35 U.S.C. § 101 as allegedly being directed to non-statutory subject matter. Particularly, the Examiner alleges that claim 11 defines a computer program embodying functional descriptive material which is non-statutory. However, the Examiner suggests amending the claim to embody the program on "computer-readable medium" in order to make the claim statutory. Although the Applicants disagree with the Examiner's contention, claim 11 has been canceled thereby rendering the rejection moot.

35 U.S.C. § 112, 2ND PARAGRAPH REJECTION

Claims 1, 2, and 9 are rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite.

Regarding claim 1, Applicants initially disagree with the Examiner's assertion that the use of the n variable renders the meaning of the claim ambiguous. Applicants respectfully submit that the Examiner's focus during examination for compliance with the requirement of

definiteness in § 112, 2nd paragraph is whether the claim meets the threshold requirements of clarity and precision. To do this, the Examiner needs only ensure that the claims define the invention with a reasonable degree of particularity and distinctness. See MPEP § 2173.02.

Although Applicants do not necessarily agree with the Examiner's assertion of indefiniteness, Applicants have canceled claim 1 and added claim 17 to recite similar features in order to expedite prosecution. New claim 17 recites subject matter of previously submitted claim 1 and further recites, *inter alia*, "characterized by projecting and accumulating the selected points onto the axis or axes for m of the n variables, corresponding to the n -dimensions of the Hough space, where m is less than n ". Claim 17 clarifies that the n variables correspond to the n dimensions of the Hough space. Applicants respectfully submit that the Hough space can have more than 2 dimensions, depending on how many parameters are used to characterize the "objects". If "objects" are lines in 2D space as an image, there are two parameters, but there could be other objects that require more parameters. For example, the three-dimensional Hough transform has been applied to the problem of automated arc line identification. It is therefore appropriate to refer to n and m variables in the claims. Thus, Applicants respectfully submit that claim 17 is not indefinite.

Regarding claim 2, the Examiner alleges that the phrase "such as" renders the claim indefinite. Claim 2 has been canceled and thereby rendering the rejection moot. New claim 18 recites subject matter of previously submitted claim 2, but does not contain the phrase "such as". Thus, Applicants respectfully submit that claim 18 is not indefinite.

Regarding claim 9, the Examiner alleges that “the reference images” lacks proper antecedent basis. Claim 9 has been canceled and thereby rendering the rejection moot. New claim 30 recites subject matter of previously submitted claim 9 and further recites, *inter alia*, “**generating a plurality of random reference images**”. Thus, Applicants respectfully submit that claim 30 is not indefinite.

Accordingly, Applicants respectfully request that the Section 112, second paragraph rejection be withdrawn.

35 U.S.C. § 102 REJECTION - Osada

Claims 1-7 and 9-15 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Osada (US 5,629,989). Applicants canceled claims 1-7 and 9-15 and thereby rendering the rejection moot. Further, Applicants respectfully submit that Osada does not anticipate newly added independent claims 17, 28-30, 35, and 36.

For a Section 102 rejection to be proper, the cited reference must teach or suggest each and every claimed element. See M.P.E.P. 2131; M.P.E.P. 706.02. Thus, if the cited reference fails to teach or suggest one or more elements, then the rejection is improper and must be withdrawn.

First, Osada fails to teach or suggest each and every claimed element of independent claims 17, 28, and 29. For example, independent claim 17 recites, *inter alia*, “projecting and accumulating the selected points onto the axis or axes for m of the n variables, corresponding to the n -dimensions of the Hough space, where m is less than n , and analysing the m

variables and the corresponding accumulated values to derive information about the features in the image space.” *Emphasis added.* Independent claims 28 and 29 recites means and a computer readable medium respectively for performing the above-identified claim features of claim 17. It is respectfully submitted that Osada does not teach or suggest at least the above identified claim features of independent claims 17, 28, and 29.

Osada merely discloses an image line-segment extracting apparatus including an image pick-up portion 1, an edge detecting portion 2 for detecting an edge of the image transmitted from the image pick-up portion 1 by differentiating a digitized image consisting of pixels, a Hough transform portion 3 for transforming a sequence of dots composing the detected edge in an image into Hough function curves, a histogram plotting portion 4 for making a histogram of Hough function values, and a line-segment extracting portion 5 consisting of a microcomputer which detects a frequency peak of the histogram and selects and extracts a line-segment from the image, judging that a sequence of dots composing the image edge corresponding to the Hough function curves passing the detected peak is the line segment, and which also conducts the concentrated control of the whole system of the apparatus. Osada is particularly concerned in determining a region and an amount of influence of a remarkable peak upon frequency distribution of a histogram plotted by the histogram plotting portion 4. Further, Osada discloses a means to judge whether detected peaks other than the remarkable peak lie in the region or not and means to correct frequency values of the other peaks judged to be in the defined region according to the determined amount of influence. (See col. 3, lines 17-46.)

As demonstrated above, claims 17, 28, and 29 requires that selected points in the Hough space are accumulated onto the axis or axes for m of the n variables of the n dimensional Hough space, and the m variables and the corresponding accumulated values are analysed to derive information about the features in the image space. That is, the analysis involves the accumulated values of the selected points and the corresponding values of the variables (see, for example, Fig. 8).

Conversely, in the case of a Hough transform into 2-dimensional Hough space, as in Osada, after the histogram is calculated in Hough space, the selected points (for example, peaks) are detected, and then accumulated onto an axis, such as the θ axis. The accumulated values and the corresponding values for θ are analysed which can provide additional information about features, such as lines, in the original image.

Although Osada describes a technique involving the Hough transform, including deriving a histogram in Hough space and detecting peaks, it is respectfully submitted that Osada does not disclose or suggest accumulating (or summing) peaks onto one of the axes of the Hough space as claimed by the Applicants. Thus, it is respectfully submitted that Osada cannot anticipate, at least, “projecting and accumulating the selected points onto the axis or axes for m of the n variables, corresponding to the n -dimensions of the Hough space, where m is less than n , and analysing the m variables and the corresponding accumulated values to derive information about the features in the image space” as recited in independent claims 17, 28, and 29.

Second, Osada fails to teach or suggest each and every claimed element of independent claims 30, 35, and 36. For example, independent claim 30 recites, “a method of generating a threshold for identifying features in a subject image using the Hough transform, the method comprising generating a plurality of reference images, for each reference image performing a Hough transform and deriving a histogram of accumulated values in Hough space, combining the histograms for the reference images, and using the combined histograms to derive a threshold.” *Emphasis added*. Independent claims 35 and 36 recite means and a computer readable medium respectively for performing the above-identified claim features of claim 30. It is respectfully submitted that Osada does not teach or suggest at least the above identified claim features of independent claims 30, 35, and 36.

Particularly, independent claims 30, 35, and 36 generates a threshold for identifying features using a Hough transform, that is, a threshold for detecting peaks in the Hough space. For each of a plurality of reference images, a histogram in Hough space is derived. The plurality of histograms in Hough space are then combined (e.g., averaged) to derive a threshold, which can be used to, for example, to detect peaks in the Hough space. Combining the histograms for a plurality of reference images can give an idea of the image in Hough space from random image behaviour, and hence a guide of how to set the threshold for detecting peaks in the Hough space that correspond to genuine feature points (e.g., lines) in an original image.

Claim 30 recites, *inter alia*, “combining histograms in Hough space to derive a threshold.” Applicants respectfully submit that Osada fails to teach any step of deriving a threshold by combining histograms in Hough space. Even if the passage in col. 4, lines 6-9 (“it

is experimentally adopted that the dot detected with its edge strength not more than 5 is not granted as an edge pixel") is interpreted as deriving a threshold, this relates to the initial step of edge detection, which is **before** the Hough transform and histogram plotting. Conversely, independent claims 30, 35, and 36 recites, *inter alia*, "for each reference image **performing a Hough transform** and **deriving a histogram** of accumulated values in Hough space, **combining the histograms** for the reference images, and **using the combined histograms to derive a threshold**". Accordingly, it is respectfully submitted that Osada cannot anticipate independent claims 30, 35, and 36.

Therefore, for at least these reasons, independent claims 17, 28-30, 35, and 36 are distinguishable from Osada. Dependent claims 18-27 and 31-34 are at least allowable by virtue of their dependency on corresponding allowable independent claims.

35 U.S.C. § 103 REJECTION – Osada, Laumeyer

Claims 8 and 16 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Osada (US 5,629,989) in view of Laumeyer et al. (US 6,363,161 B2). Claims 8 and 16 have been canceled and thereby rendering the rejection moot. However, new claim 27 recites similar subject matter as previously submitted claim 8. Applicants respectfully submit that the combination of Osada and Laumeyer does not render claim 27 obvious.

For a Section 103 rejection to be proper, a prima facie case of obviousness must be established. See M.P.E.P. 2142. One requirement to establish prima facie case of obviousness is that the prior art references, when combined, must teach or suggest all claim limitations. See

M.P.E.P. 2142; M.P.E.P. 706.02(j). Thus, if the cited references fail to teach or suggest one or more elements, then the rejection is improper and must be withdrawn.

Claim 27 depends from claim 17. It is respectfully submitted that the combination of Osada and Laumeyer fails to teach or suggest each and every limitation of claim 17. As demonstrated above, Osada fails to teach or suggest “projecting and accumulating the selected points onto the axis or axes for m of the n variables, corresponding to the n -dimensions of the Hough space, where m is less than n , and analysing the m variables and the corresponding accumulated values to derive information about the features in the image space” as recited in claim 17. Laumeyer has not been, and indeed cannot be, relied upon to correct at least this deficiency of Osada. Laumeyer merely discloses a system for automatically generating a database of images and positions of objects of interest identified from video images depicting roadside scenes that are recorded from a vehicle navigating a road and having a system that stores location metrics for the video images. (See Abstract.)

Therefore, for at least these reasons, claim 27 is distinguishable from the combination of Osada and Laumeyer.

CONCLUSION

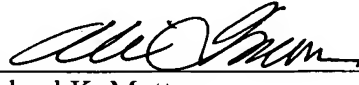
In view of the above amendment, Applicants believe the pending application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Ali M. Imam Reg. No. 58,755 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

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